

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>In re</i> Application of:	Tie Wang, et al.	:	Confirmation No.:	2840
Serial No.:	10/766,746	:	Art Unit:	2813
Filed:	1/27/2004	:	Examiner:	Jennifer M. Dolan
For:	STRIP-FABRICATED FLIP CHIP IN PACKAGE AND FLIP CHIP IN SYSTEM HEAT SPREADER ASSEMBLIES AND FABRICATION METHODS THEREFOR			

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**AMENDMENT AND RESPONSE AFTER FINAL REJECTION
UNDER 37 C.F.R. §1.116**

Madam:

The following Amendment and Remarks are submitted under 37 C.F.R. §1.116 in response to the Final Office Action mailed March 15, 2006, following the amendment format set forth under 37 CFR §1.121. After this introductory section, there are Amendments to the Claims, and then Remarks, each starting on a separate page.

Amendments to the Claims consist of amendments for claims 1, 6, 11, and 16, which are incorporated in a complete listing of the claims.

Reconsideration of the rejections is respectfully requested.

AMENDMENTS TO CLAIMS

- Please amend pending claims 1, 6, 11, and 16 as indicated below. A complete listing of all claims and their status in the application are as follows:

1. (currently amended) A method for fabricating a semiconductor package, comprising:

providing a substrate in a strip format;

attaching semiconductor devices in a strip format to the substrate;

applying an underfill between the semiconductor devices and the substrate;

applying a thermal interface material to the semiconductor devices;

attaching a flat panel heat spreader to each semiconductor device;

encapsulating all of the volume ~~around~~ immediately surrounding the semiconductor devices except that volume filed by the substrate, the underfill between the semiconductor devices and the substrate, the thermal interface material applied to the semiconductor devices, the flat panel heat spreader attached to each semiconductor device, and other electronic devices assembled on the substrate, with open encapsulation, leaving the surface of the flat panel heat spreader opposite the substrate externally exposed; and

singulating individual semiconductor packages from the strip format.

2. (original) The method of claim 1 wherein the heat spreader is a pre-cut flat panel configuration.

3. (original) The method of claim 1 wherein the heat spreader is a continuous flat panel heat spreader attached over substantially the entire strip format.

4. (original) The method of claim 3 further comprising cutting the continuous flat panel heat spreader into individual heat spreader panels following attaching the flat panel heat spreader.

5. (original) The method of claim 3 further comprising dispensing an encapsulant for encapsulating the semiconductor devices and for attaching the flat panel heat spreader prior to attaching the flat panel heat spreader.

6. (currently amended) A method for fabricating a semiconductor package, comprising:

- providing a substrate in a continuous strip format;
- attaching semiconductor devices in a continuous strip format to the substrate;
- applying an underfill between the semiconductor devices and the substrate;
- applying a thermal interface material to the upper faces of the semiconductor devices opposite the substrate;
- attaching a flat panel heat spreader to each semiconductor device by means of the thermal interface material;
- curing the thermal interface material;
- encapsulating all of the volume ~~around~~ immediately surrounding the semiconductor devices and portions of the flat panel heat spreader except that volume filed by the substrate, the underfill between the semiconductor devices and the substrate, the thermal interface material applied to the upper faces of the semiconductor devices, the flat panel heat spreader attached to each semiconductor device, and other electronic devices assembled on the substrate, with open encapsulation, leaving the surface of the flat panel heat spreader opposite the substrate externally exposed;
- attaching ball grid arrays to the substrate opposite the semiconductor devices; and
- singulating individual semiconductor packages from the continuous strip format.

7. (original) The method of claim 6 wherein the heat spreader is a pre-cut flat panel configuration.

8. (original) The method of claim 6 wherein the heat spreader is a continuous flat panel heat spreader attached over substantially the entire continuous strip format.

9. (original) The method of claim 8 further comprising cutting the continuous flat panel heat spreader into individual heat spreader panels following the steps of attaching the flat panel heat spreader and curing the thermal interface material.

10. (original) The method of claim 8 further comprising dispensing an encapsulant for encapsulating the semiconductor devices and for attaching the flat panel heat spreader prior to attaching the flat panel heat spreader.

11. (currently amended) Semiconductor packages in a strip format, comprising:
a substrate in a strip format;
semiconductor devices attached in a strip format to the substrate;
an underfill between the semiconductor devices and the substrate;
a thermal interface material applied to the semiconductor devices;
a flat panel heat spreader attached to each semiconductor device;
all of the volume ~~around~~ immediately surrounding the semiconductor devices except
that volume filed by the substrate, the underfill between the semiconductor
devices and the substrate, the thermal interface material applied to the
semiconductor devices, the flat panel heat spreader attached to each
semiconductor device, and other electronic devices assembled on the substrate,
being encapsulated with the surface of the flat panel heat spreader opposite the
substrate being externally exposed; and
the packages having indicia characteristic of strip open encapsulation.

12. (original) The semiconductor packages of claim 11 wherein the flat panel heat spreader is a pre-cut flat panel configuration.

13. (original) The semiconductor packages of claim 11 wherein the flat panel heat spreader is an individual heat spreader panel cut from a continuous flat panel heat spreader.

14. (original) The semiconductor packages of claim 11 wherein the flat panel heat spreader is a continuous flat panel heat spreader attached over substantially the entire strip format.

15. (original) The semiconductor packages of claim 11 further comprising individual semiconductor packages singulated from the strip format and having indicia characteristic of strip singulation.

16. (currently amended) Semiconductor packages in a continuous strip format, comprising:

- a substrate in a continuous strip format;
- semiconductor devices attached in a continuous strip format to the substrate;
- an underfill between the semiconductor devices and the substrate;
- a thermal interface material applied to the upper faces of the semiconductor devices opposite the substrate;
- a flat panel heat spreader attached to each semiconductor device by means of the thermal interface material;
- all of the volume ~~around~~ immediately surrounding the semiconductor devices and portions of the flat panel heat spreader except that volume filed by the substrate, the underfill between the semiconductor devices and the substrate, the thermal interface material applied to the upper faces of the semiconductor devices, the flat panel heat spreader attached to each semiconductor device, and other electronic devices assembled on the substrate, being encapsulated with the surface of the flat panel heat spreader opposite the substrate being externally exposed;
- ball grid arrays attached to the substrate opposite the semiconductor devices; and
- the packages having indicia characteristic of strip open encapsulation.

17. (original) The semiconductor packages of claim 16 wherein the flat panel heat spreader is a pre-cut flat panel configuration.

18. (original) The semiconductor packages of claim 16 wherein the flat panel heat spreader is individual heat spreader panels cut from a continuous flat panel heat spreader.

19. (original) The semiconductor packages of claim 16 wherein the flat panel heat spreader is a continuous flat panel heat spreader attached over substantially the entire strip format.

20. (original) The semiconductor packages of claim 16 further comprising individual semiconductor packages singulated from the strip format and having indicia characteristic of strip singulation.